



Original communication

Health-care issues and health-care use among detainees in police custody

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ABSTRACT

Epidemiological research on the physical health status of police detainees is scarce. The present study fills this gap by first studying the somatic reasons for consultation ($n = 4396$) and related prescriptions ($n = 4912$) as assessed by the forensic medical service during police detainment. Secondly, a health interview survey was conducted among randomly selected police detainees ($n = 264$) to collect information regarding their recent disease history and use of health care. Somatic health problems, medical consumption and health risk measures of the detainees were compared with those seen in the general population using general practitioner records and community health survey data. The study showed that, in police detainment, several chronic health conditions more often were the reason for consultation than in the general practice setting. In addition, the health interview survey data demonstrated that after adjustment for age and gender, the police detainees were 1.6 times more likely to suffer from one or more of the studied chronic diseases than the members from the general population. Furthermore, differences in several health risk measures, including body mass index, smoking and alcohol habits and health-care use were observed between the interviewed police detainees and the general population. These results provide insight into the variety of physical health problems of police detainees and are essential to develop optimal treatment strategies in police custody.

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1. Introduction

Nowadays, more than 9.8 million people are held in custody throughout the world, mostly as pre-trial detainees or as sentenced prisoners.¹ In the Netherlands, more than 40,000 individuals spent time in a penal institution in 2009,² and many more people interact annually with the criminal justice system. In the Dutch capital Amsterdam alone, approximately 12,000 persons were held in the cell blocks of the police in 2009. It is clear that the populations held in police cells and prisons overlap as contact with the police often is the first point of entry into the criminal justice system. The major difference between the two populations is that police detainees are merely suspects whereas prisoners are sentenced for committing a crime.

According to various international standards, all persons held in custody have a constitutional right to medical care and treatment equivalent to those available to the general community.^{3,4} As

detainees cannot contact a doctor anytime as in freedom, those caring for police detainees carry a high responsibility. If health risks are misjudged, health damage and even death might occur. Those involved in the care of the detainee will be held responsible and face prosecution.

From prison research, it is known that prisoners have an increased risk of various health problems, including hypertension, asthma, hepatitis, human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS) and other chronic diseases.^{5–7} Others revealed that a substantial proportion of the individuals in jails and prisons suffer from mental and psychiatric disorders and dependence syndromes.^{8–10} Compared to community populations, prisoners consult primary care doctors three times more frequently and receive inpatient care at least 10 times as frequently.¹¹

Compared to the wealth of information on the health of prisoners, only little systematic information is available about those held in police custody. Research on health-care issues of police detainees is widely lacking, apart from a few studies focussing on mental disorders^{12–15} and an inventory of general health aspects and illicit drug use among a selected sample of police detainees.^{13,14}

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Just like those held in prison, detainees of the police have a right to medical care. In the Netherlands, forensic physicians and nurses have a central role in the provision of medical services to police detainees. Insight into the prevalence of health problems is essential for forensic physicians and nurses to address the medical needs of detainees and to develop optimal treatment strategies in police custody. Therefore, the current study examined the medical diagnoses and medicinal treatment of detainees seen in police custody by forensic physicians and nurses and compared them to those seen in the general population, using general practitioner records. Furthermore, several health risk measures, health-care use and common chronic medical conditions of randomly selected police detainees were compared with the general population using community health survey data.

2. Methods

The study is based on the following sources of information:

- (1) The electronic registration of the Forensic Medicine Department of the Amsterdam Public Health Service. Data cover consultations to detainees held in cell blocks of the Police Service Amsterdam-Amstelland during July 2008–June 2009 ('detainee sample').
- (2) Data obtained from the Netherlands Information Network of General Practice (LINH) for the year 2009 ('general practice sample'), providing reference data for the detainee sample.
- (3) Interview data collected among randomly selected police detainees held in cell blocks of the Police Service Amsterdam-Amstelland during March–June 2009 ('health interview sample').
- (4) Data obtained from the Amsterdam Health Monitor, a cross-sectional population-based health survey performed by the Amsterdam Public Health Service in 2008 providing reference data for the detainee health interview.

2.1. Detainee sample and general practice sample

In Amsterdam and neighbouring regions, on-site medical care of police detainees held in police custody is provided by forensic physicians and nurses of the Forensic Medicine Department of the Amsterdam Public Health Service. They annually conduct approximately 12,000 consultations in police custody. Almost 8000 of these consultations take place at cell blocks especially equipped for overnight stays. In total, there are three central cell blocks in Amsterdam with a total capacity of 170 cells. Police detainees may be incarcerated for questioning for a maximum period of 6 h.¹⁶ As this does not include the hours between midnight and 9 a.m., the maximum period is actually 15 h. In the interests of the investigation, the period of police custody can be extended twice by a period of 3 days.

Medical assessment during custody may be at the detainees' request or at the initiative of the police if signs of intoxication, drug dependence or withdrawal or other health-care issues are identified. Each detainee consultation by the forensic physician or nurse is systematically documented in the electronic registry of the forensic medical service. Hereby, symptoms and diagnoses are classified using the International Classification of Primary Care (ICPC). The ICPC consists of different chapters referring to organ systems, lettered from A to Z. The classification has been used worldwide as an epidemiologic tool to classify data with respect to three important elements of the health-care encounter: reasons for encounter, diagnosis or problem and the process of care.^{17,18}

In the present study, we focussed on the ICPC codes of somatic conditions of all detainee consultations that took place in the three

cell blocks in Amsterdam between July 2008 and June 2009. Those ICPC codes were extracted from the registry (4453 codes belonging to 3976 consultations; 49% of all ICPC codes). Furthermore, Anatomical Therapeutic Chemical (ATC) classification codes were used to code the prescription data extracted from the registry to examine medication use of the detainees during police custody in the cell blocks, between July 2008 and June 2009. ATC is considered an important tool for presenting drug use statistics and it is recommended for use in international comparisons.¹⁹ All ATC codes except the prescriptions belonging to the ATC category 'Nervous System' were analysed due to the focus on somatic health problems in the current study (4912 codes belonging to 2173 consultations; 50% of all ATC codes).²⁰

Reference data regarding ICPC diagnoses and ATC codes from the LINH for the year 2009 were obtained.²¹ LINH collects data about morbidity, contacts, drug prescriptions and referrals using a network of general practitioner practices, which is representative of the Dutch population concerning age, sex and urbanisation degree. For the present study, information on somatic ICPC diagnoses and ATC codes of general practitioner patients was restricted to men and women, aged 20–60 years old to achieve an age distribution comparable to that of the police detainee population (396,905 consultations and 464,487 prescriptions). As a result, the mean age of the general practice population and detainee population visited by the forensic medical service was 41 years (SD = 11.8) and 37 years (SD = 12.1), respectively (Table 1).

2.2. Health interview survey of randomly selected police detainees and Amsterdam Health Monitor Survey

Randomly selected detainees ($n = 402$), who were arrested and held in custody between March and June 2009 at one of the three cell blocks in Amsterdam, were invited to participate in an on-site, anonymised, structured health interview survey. During this health interview survey, information regarding the physical health status and health service use of the detainee was collected in analogy to the Amsterdam Health Monitor Survey conducted in 2008.²² The Amsterdam Health Monitor is a cross-sectional population-based health survey performed by the Amsterdam Public Health Service every 4 years. The 2008 survey was stratified by age groups and city districts. The response rate was 50.4% ($n = 6644$). In both the Amsterdam Health Monitor and the detainee health interview survey, use of health services was measured by 'last contact with the general practitioner' and 'visit to a medical specialist during the past 12 months'. In addition, the detainee was asked if he/she had experienced in the past year some of the following conditions: diabetes, hypertension, cerebral vascular disease, heart attack, other heart diseases (such as angina pectoris or heart failure), cancer, chronic pulmonary problems (such as asthma, bronchitis, emphysema or chronic obstructive pulmonary disease), chronic joint inflammation and chronic skin disease. Body mass index (BMI) scores from self-reported height and weight estimates without clothing were calculated as kg/m^2 . Smoking status was defined as 'never-smoker', 'former smoker' and 'current smoker', and among current smokers, the daily cigarette consumption was assessed. Based on the definition of Statistics Netherlands, alcohol

Table 1
Socio-demographic characteristics of detainees consulted by the forensic medical service and patients treated in general practice.

	Detainee sample ($n = 3232$)	General practice sample ($n = 78975$)
Age in years (SD)	37.2 (12.1)	40.6 (11.8)
Men (%)	2762 (86.3)	35597 (45.1)

consumption was categorised as 'non-drinker', 'excessive alcohol consumption' (at least 1 day a week with ≥ 6 drinks for males and ≥ 4 drinks for women) and 'moderate alcohol consumption' (less than 1 day a week with ≥ 6 drinks and ≥ 4 drinks in women).²³ Subsequently, all these physical health status parameters of the police detainees were compared with the Amsterdam Health Monitor Survey data. In addition, several socio-demographic variables of the police detainees including age, gender, ethnicity, educational level, employment status and marital status were collected. Ethnicity was classified according to the self-reported country of birth of the detainee's parents.²⁴ When at least one parent was born abroad, the detainee was considered belonging to an ethnic minority. These socio-demographic characteristics of the police detainees were compared to the characteristics of the Amsterdam citizens aged between 20 and 60 years obtained from Statistics Netherlands.²³

2.3. Procedure of the health interview survey

The health interview survey was conducted by specially trained interviewers, and the interviews on average took 20 min to complete. In total, 264 of the 402 police detainees (66%) who were approached participated in the health interview survey. A total of 99 detainees refused to participate, 30 detainees suffered from severe language problems, four were willing to participate but were transferred/interrogated at the moment the interview was scheduled, four times the reasons for non-participation were not recorded and in one case, the detainee could not participate in the health interview survey in the interest of the police investigation. No differences were observed between the participants and the non-participants in age (32.4 ± 11.9 vs. 32.9 ± 10.8 years, $P = 0.7$) and gender (92% vs. 93% male, $P = 1.0$).

2.4. Statistical analysis

ICPC and ATC codes of the consultations by the forensic physicians and nurses during the study period were summarised using descriptive statistics and compared to Dutch general practice data equivalent for age and gender provided by LINH. Health-care use, health risk factors and various health conditions of the interviewed detainees were compared with the Amsterdam Health Monitor Survey data using logistic regression analyses (SPSS Complex Samples Procedure). In these analyses, weights had to be used to adjust for the effects of stratification originally applied in the Amsterdam Health Monitor. For the analysis of socio-demographic characteristics, no weights were used. Instead, detainees' characteristics were directly compared to the characteristics of the Amsterdam citizens using chi-square tests as the stratification of data was based on this distribution.²³

Results of the regression analyses were shown as odds ratio (OR) and corresponding 95% confidence interval (CI). For instance, the calculated ORs reflect the chance that the selected chronic diseases are more prevalent among detainees than in the general population. In case an OR is >1 and the corresponding P -value is <0.05 , this implies that the chance is significantly increased; in case an OR is <1 and the corresponding P -value is <0.05 , this implies that the chance is significantly decreased. All analyses were performed using SPSS 17.0 for Windows.

3. Results

3.1. Police detainee consultations by the forensic medical service

Between July 2008 and June 2009, 17 231 detainments took place in the three police cell blocks in Amsterdam concerning

11 683 unique persons. Twenty-eight percent of these persons were attended by a forensic physician or nurse during custody. Consultation became more common with increasing detainee age (<25 years of age: 13%; 25–34 years of age: 21%; 35–44 years of age: 29%; ≥ 45 years of age: 37%).

In 52.5% ($n = 3165$) of all consultations during police custody ($n = 6027$), one or more somatic complaints and diseases were diagnosed. The top 20 most common somatic ICPC diagnoses are listed according to gender in Table 2. Among male detainees, several chronic conditions such as diabetes mellitus, asthma, HIV/AIDS and epilepsy as well as various complaints including lacerations, pain and musculoskeletal problems were more often the reason for consultation by the forensic medical service compared with a sex- and age-equivalent population seen by the general practitioner. Among female detainees, hypertension, diabetes mellitus, asthma, HIV/AIDS, musculoskeletal complaints and pregnancy-related problems were frequently the reason for consultation as compared to the general practitioner population. In males, the top 20 most frequently used ICPC codes for detainee consultations amounted to 57%. In general practice, these codes were used in 24% of all diagnoses.

Most frequent prescriptions for somatic health problems issued to male detainees by the forensic medical service concerned the alimentary tract and metabolism (34%), followed by drugs for the cardiovascular system (26%) and drugs for the respiratory system (14%) (Table 3). In general practice, drugs for the alimentary tract and metabolism are prescribed far less often (16%), whereas the other two types are more or less equally prescribed (26% and 14–15%, respectively). Also to female detainees, drugs affecting the alimentary tract and metabolism (26%), the cardiovascular (23%) and respiratory system (20%) are most often prescribed, comparing to 14%, 17% and 16% in female general practice patients, respectively.

Based on the findings during the consultations ($n = 3919$), forensic physicians and nurses decided to send 44 detainees to the hospital for further physical examination and/or treatment (1.1%). Reasons for immediate referral to hospital included diabetes-related emergencies ($n = 3$), (post) ictal state ($n = 3$), suspicion of a cerebrovascular accident ($n = 1$) and nitrogen-resistant angina pectoris with four previous percutaneous transluminal coronary angioplasty ($n = 1$). Furthermore, clinical suspicion of a fracture ($n = 19$), tuberculosis ($n = 1$), undiagnosed diabetes ($n = 1$) and inguinal hernia ($n = 1$), gastrointestinal problems ($n = 3$), pregnancy-related complaints ($n = 1$), increased intake of methadone ($n = 1$), thirst and hunger striker ($n = 1$), renal dialysis ($n = 1$), haemarthrosis ($n = 2$), dermatosis ($n = 1$) and small surgical interventions ($n = 4$) were other reasons for hospital referral.

3.2. Health interview survey police detainees

Randomly selected detainees, who were arrested and held in custody between March and June 2009, were asked about their physical health condition and health-care use during a structured health interview survey ($n = 264$). Table 4 describes the socio-demographic characteristics of those police detainees compared to data of the general adult population in Amsterdam. The detainees appeared to be younger and more likely to be male, belonging to an ethnic minority group, low-educated, currently unemployed and unmarried or divorced. Furthermore, 58% ($n = 149$) of the detainees reported having a permanent home, 27% ($n = 70$) indicated living in a temporary accommodation, 5% ($n = 13$) reported staying in a shelter house and 10% ($n = 25$) appeared to be homeless.

Comparison of health-care use revealed significant differences between the police detainees and the general population in Amsterdam (Table 5). Some of these differences disappeared after

Table 2

The top 20 most common somatic diagnoses for forensic medical service—detainee consultations between July 2008 and June 2009 compared to general practice (GP) data according to gender.

	Men					Women			
	Detainee sample		GP sample			Detainee sample		GP sample	
	ICPC diagnoses (%)	Patients ^c (%)	ICPC diagnoses (%)	Patients ^c (%)		ICPC diagnoses (%)	Patients ^c (%)	ICPC diagnoses (%)	Patients ^c (%)
T90 Diabetes mellitus	11 ^b	9 ^b	2	2	K86 Hypertension uncomplicated	13 ^b	13 ^b	7	8
K86 Hypertension uncomplicated	10	9	9	8	R96 Asthma	7 ^b	8 ^a	3	5
R96 Asthma	6 ^b	8 ^b	3	4	T90 Diabetes mellitus	5 ^b	6 ^b	1	1
S18 Laceration/cut	4 ^b	6 ^b	1	2	W78 Pregnancy	5 ^b	7 ^b	1	3
A01 Pain general/multiple sites	3 ^b	6 ^b	0.3	0.4	A01 Pain general/multiple sites	4 ^b	7 ^b	0.3	1
B90 HIV-infection/aids	3 ^b	3 ^b	0.04	0.1	B90 HIV-infection/aids	3 ^b	2 ^b	0.01	0.02
N88 Epilepsy	2 ^b	3 ^b	0.5	0.7	D06 Abdominal pain localized other	2	3	2	5
D02 Abdominal pain epigastric	2 ^a	3	2	3	L12 Hand/finger symptom/complaint	2 ^b	2	1	2
L12 Hand/finger symptom/complaint	2 ^b	3 ^b	1	2	L02 Back symptom/complaint	2 ^b	2	1	3
D03 Heartburn	2 ^b	3 ^b	1	1	R95 Chronic obstructive pulmonary disease	2	3 ^a	1	1
R95 Chronic obstructive pulmonary disease	2	2 ^a	1	1	N88 Epilepsy	2 ^b	2 ^b	0.4	1
L02 Back symptom/complaint	1	2 ^a	1	3	S02 Pruritus	2 ^b	2	1	2
K84 Heart disease other	1 ^b	2 ^b	0.1	0.1	W03 Antepartum bleeding	2 ^b	1 ^b	0.01	0.1
L15 Knee symptom/complaint	1	2 ^b	2	4	D03 Heartburn	1 ^a	2	1	1
D19 Teeth/gum symptom/complaint	1 ^b	2 ^b	0.2	0.4	D02 Abdominal pain epigastric	1	2	2	4
L17 Foot/toe symptom/complaint	1 ^a	2	1	3	D01 Abdominal pain/cramps general	1	1	1	2
R98 Hyperventilation syndrome	1 ^b	2 ^b	0.2	0.4	K84 Heart disease other	1 ^b	1 ^b	0.05	0.1
L03 Low back symptom/complaint	1 ^b	2 ^b	2	6	L11 Wrist symptom/complaint	1 ^b	2	0.3	1
L14 Leg/thigh symptom/complaint	1 ^b	1	1	2	L15 Knee symptom/complaint	1	1 ^a	1	3
S21 Skin texture symptom/complaint	1 ^b	1 ^b	0.07	0.2	R81 Pneumonia	1 ^b	1	0.3	1
Total top 20 somatic ICPC codes	57 ^b	58 ^b	28	46	Total top 20 ICPC codes	57 ^b	58 ^b	22	15
Other somatic ICPC codes	43	42	72	54	Other somatic ICPC codes	43	42	78	85
Total no.	3828	1851	151,054	32,829		529	299	245,781	40,770

GP sample = general practice sample.

Exclusive ICPC A97; of 39 ICPC diagnoses, gender was not registered, therefore these cases are not shown.

^a $P < 0.05$ as compared to GP counterparts.

^b $P < 0.01$ as compared to GP counterparts.

^c On the patient level, the sum of column percentages exceeds 100% as individual patients can have more than one health problem.

correction for age and gender, for instance the visit to a medical specialist. Nevertheless, even after adjustment, police detainees were less likely to have visited their general practitioner in the previous 12 months compared to members of the general

population. Furthermore, approximately 72% of the police detainees ($n = 189$) reported to have a general practitioner. Fifteen percent ($n = 40$) reported to have been hospitalised for at least 1 night during the previous 12 months. Five percent ($n = 12$) and 23%

Table 3

Range of medication prescribed by the forensic physician between July 2008 and June 2009 by ATC group compared to general practice (GP) data according to gender.

	Men				Women			
	Detainee sample		GP sample		Detainee sample		GP sample	
	Prescriptions (%)	Patients ^d (%)	Prescriptions (%)	Patients ^d (%)	Prescriptions (%)	Patients ^d (%)	Prescriptions (%)	Patients ^d (%)
A – Alimentary tract and metabolism	34 ^c	28	16	25	26 ^c	25	14	26
B – Blood and blood forming organs	7 ^c	7 ^c	5	9	4	6	4	8
C – Cardiovascular system	26	15 ^c	26	22	23 ^c	14	17	18
D – Dermatologicals	1 ^c	1 ^c	10	28	0 ^c	0	9	28
G – Genito-urinary system and sex hormones	0.3 ^c	1 ^c	2	4	4 ^c	5 ^c	11	36
H – Systemic hormonal preparations ^a	2 ^b	2 ^c	2	6	2 ^b	3 ^c	4	9
J – Anti-infectives for systemic use	8 ^c	6 ^c	6	24	7	6 ^c	8	31
L – Antineoplastic and immunomodulating agents	0.5	1	1	1	1	0.4	1	1
M – Musculoskeletal system	4 ^c	7 ^c	9	26	7	10 ^c	8	25
P – Antiparasitic products, insecticides and repellents	0.1 ^b	0.2 ^c	0.3	2	0 ^b	0	1	3
R – Respiratory system	14 ^c	13 ^c	15	29	20 ^b	19 ^c	16	32
S – Sensory organs	1 ^c	1 ^c	4	13	3	2 ^c	4	13
V – Various	0.3 ^c	0.4	0.1	0.3	0.5 ^c	0.4	0.1	0.2
Unclassified	2 ^c	4 ^c	4	13	3	5 ^c	4	14
Total no.	4265	1643	150,788	26,396	630	273	220,256	35,383

GP sample = general practice sample.

Prescriptions belonging to the ATC-category 'Nervous System' ($n = 4835$) were not shown in the table due to the focus on somatic health problems in the current study. Of 17 prescriptions, gender was not registered, therefore these cases are not shown.

^a Excluding sex hormones and insulins.

^b $P < 0.05$ as compared to GP counterparts.

^c $P < 0.01$ as compared to GP counterparts.

^d On the patient level, the sum of column percentages exceeds 100% as individual patients can receive more than one prescription.

Table 4

Socio-demographic characteristics of police detainees who participated in the health interview survey ($n = 264$) compared to the general adult population in Amsterdam.

	Detainees – Health interview	Citizens of Amsterdam aged 20–60 years ^b	P-value
	No. (%)	No. × 1000 (%)	
Age			
<30 yrs	122 (47%)	131 (27%)	<0.001
30–39 yrs	65 (25%)	137 (29%)	
40–49 yrs	48 (19%)	118 (25%)	
≥50 yrs	25 (10%)	91 (19%)	
Gender			
Male	244 (92%)	239 (50%)	<0.001
Female	20 (8%)	239 (50%)	
Ethnicity			
Native Dutch	59 (23%)	238 (50%)	<0.001
Western origin	24 (9%)	79 (16%)	
Turkish	6 (2%)	24 (5%)	
Moroccan	35 (14%)	37 (8%)	
Surinamese	62 (24%)	44 (9%)	
Other non-western origin	70 (27%)	57 (12%)	
Educational level ^a			
Low	174 (69%)	125 (23%)	<0.001
Medium	63 (25%)	171 (32%)	
High	17 (7%)	238 (44%)	
Employment status			
Employed	81 (32%)	360 (67%)	<0.001
Currently unemployed	117 (46%)	22 (4%)	
Inactive (out of lab force)	58 (23%)	158 (29%)	
Marital status			
Unmarried	214 (84%)	286 (60%)	<0.001
Married	16 (6%)	141 (30%)	
Divorced	25 (10%)	47 (10%)	
Widow	1 (0.4%)	3 (1%)	

^a Educational level of the general population aged 15–65 yr was shown.

^b Data provided by Statistics Netherlands.

($n = 59$) of the police detainees, respectively, consulted a clinic for the uninsured or a physician during detention during the previous 12 months.

BMI score was significantly lower among detainees as compared with members of the general population in Amsterdam (23.2 ± 4.1 vs. 25.3 ± 4.4 kg/m², $P < 0.001$ after correction for the difference in age and gender) (Table 5). Eleven percent of the detainees appeared to be underweight (BMI < 18.5 kg/m²) compared to 3% among the general population counterparts ($P < 0.001$ after correction for age and gender). Likewise, significantly less detainees were overweight (21% vs. 29% of the general population, $P = 0.01$ after correction for age and gender). More than three-quarters of the detainees were current smokers, with 83% smoking ≤20 cigarettes per day and 15% >20 cigarettes per day. Of the general population, only 27% were current smoker ($P < 0.001$ after correction for age and gender). Detainees were more likely to drink excessively than the members of the general population (21% vs. 16%, respectively, $P < 0.001$). However, this difference in alcohol consumption between the two groups disappeared after correction for age ($P = 0.3$). Twenty-seven percent of police detainees were non-drinkers compared to 21% in the general population (27%). Furthermore, 18% ($n = 46$) and 9% ($n = 24$) of the police detainees did use cocaine or opiates, respectively, during the previous 30 days. Twenty-four percent ($n = 61$) of the detainees reported using cannabis on a daily basis. This compares to 10% in the general population (Amsterdam Health Monitor Survey 2008, age group 16–54 years, not tabled). As the Amsterdam Health Monitor Survey did not include questions on opiate use, a comparison with these data was not possible.

Approximately 27% of the interviewed detainees reported suffering from at least one of the examined chronic diseases during the previous 12 months versus 31% of the general population in Amsterdam (Table 6). However, after adjustment for age and gender, the corresponding OR was 1.6 (95% CI 1.1–2.2), indicating that the police detainees were 1.6 times more likely to suffer from such a disease than the members of the general population. Furthermore, after correction for age and gender, the police detainees appeared to suffer more often than the general population from the following disorders: chronic pulmonary problems (OR = 1.9; 95% CI 1.2–3.0), chronic joint inflammation (OR = 2.3; 95% CI 1.2–4.6), hypertension (OR = 2.3; 95% CI 1.5–3.6) and serious heart diseases other than heart attack (OR = 2.3; 95% CI 1.0–5.1).

4. Discussion

In police custody, several chronic conditions more often were the reason for consultation by the forensic medical service when compared to the general practice setting. This results from a comparison of the detainees' ICPC codes with those of a general practice population comparable concerning age and gender. In addition, the health survey data demonstrated that after adjustment for age and gender, the police detainees were 1.6 times more likely to suffer from one or more of the chronic diseases under examination than their counterparts from the general population. These survey results are consistent with prior research in prison settings demonstrating that jail and prison inmates are at increased risk for hypertension, asthma, arthritis and certain types of heart diseases.^{6,7}

Moreover, concerning HIV/AIDS, our data indicate that this condition is more often the reason for consultation in the police cell than in general practice, probably due to a higher overall HIV/AIDS prevalence among police detainees. Although we did not address HIV/AIDS in the health survey, this assumption is supported by a large body of epidemiological research demonstrating that HIV prevalence in prisons is higher than in the general population.⁵

It is important to keep in mind that the data on medical consultations collected in our study are most suitable to describe differences in care provision between the general practice and police setting. Rates for consultation presented here therefore should not be interpreted as prevalence rates. Diabetes mellitus, to give an example, was more often the reason for consultation in the police setting when compared to the general practice setting. The health survey data, in contrast, did not confirm a higher prevalence of diabetes mellitus among police detainees when compared to the general population. The high consultation rate for diabetes mellitus in the police cell can be explained by the policy of the forensic medical service to visit each detainee with diagnosed diabetes mellitus to provide optimal care and avoid deregulation of the diabetes mellitus. Further, in the police cell, there are limits to the self-administration of insulin, which renders patients more dependent on medical supervision. To conclude, the data on medical consultations are not suitable to make inferences about the actual prevalence of diseases, but rather reflect differences in care provision in different settings.

Furthermore, differences in socio-demographic characteristics and several health risk measures were observed between the interviewed police detainees and the general population. The majority of the detainees appeared to be low-educated young males, currently unemployed, single and belonging to an ethnic minority group. The BMI score was significantly lower among detainees and significantly more detainees appeared to be underweight. Furthermore, detainees were more likely to be a current smoker. The difference in alcohol consumption between the two

Table 5

Health-care utilization and health risk measures of the police detainees who participated in the health interview survey ($n = 264$) compared to the general population in Amsterdam.

	Detainees – Health interview	General population ^a	Univariate association		Adjusted for age and gender	
	No. (%)	No. × 1000 (%)	OR (95% CI)	P-value	OR (95% CI)	P-value
Health-care utilization						
GP utilization						
GP use <2 months ago	65 (25%)	217 (36%)	0.6 (0.4; 0.8)	<0.001	0.9 (0.7; 1.2)	ns
GP use >2 months ago and <12 months ago	84 (32%)	232 (38%)	0.8 (0.6; 1.0)	0.05	0.8 (0.6; 1.1)	ns
GP use >12 months ago	106 (41%)	145 (24%)	2.2 (1.7; 2.8)	<0.001	1.4 (1.0; 1.8)	0.029
Never	5 (2%)	11 (2%)	1.1 (0.4; 2.7)	ns	0.6 (0.2; 1.7)	ns
Visit to medical specialist during past 12 months	77 (30%)	227 (37%)	0.7 (0.6; 0.98)	0.033	1.2 (0.9; 1.7)	ns
Health risk measures						
Body mass index						
Mean body mass index (kg/m ²)	23.2 ± 4.2	24.6 ± 4.2	na	<0.001	na	0.001
Underweight (<18.5 kg/m ²)	26 (11%)	18 (3%)	3.8 (2.4; 6.0)	<0.001	5.3 (3.0; 9.6)	<0.001
Normal weight (18.5–24.9 kg/m ²)	146 (59%)	346 (58%)	1.1 (0.8; 1.4)	ns	0.9 (0.7; 1.2)	ns
Overweight (25–29.9 kg/m ²)	52 (21%)	177 (29%)	0.6 (0.5; 0.9)	0.006	0.6 (0.5; 0.9)	0.01
Obesity (≥30 kg/m ²)	22 (9%)	60 (10%)	0.9 (0.6; 1.4)	ns	1.4 (0.9; 2.3)	ns
Tobacco smoking status						
Current smoker	193 (76%)	164 (27%)	8.5 (6.3; 11.5)	<0.001	7.2 (5.3; 9.9)	<0.001
Former smoker	22 (9%)	193 (31%)	0.2 (0.1; 0.3)	<0.001	0.3 (0.2; 0.4)	<0.001
Never smoker	40 (16%)	256 (42%)	0.3 (0.2; 0.4)	<0.001	0.2 (0.2; 0.3)	<0.001
Alcohol consumption						
No alcohol use	67 (27%)	125 (21%)	1.4 (1.0; 1.9)	0.022	1.8 (1.3; 2.5)	<0.001
Moderate alcohol use	130 (52%)	381 (64%)	0.6 (0.5; 0.8)	<0.001	0.7 (0.5; 0.9)	0.003
Excessive alcohol use	51 (21%)	93 (16%)	1.4 (1.0; 1.9)	0.038	1.0 (0.7; 1.4)	ns

^a Based on weighted estimates of the Amsterdam Health Monitor Survey conducted in 2008.

groups disappeared after correction for age. Mean BMI of the police detainees (23.2 ± 4.1 kg/m²) was comparable to the scores of police detainees examined in London by Payne-James et al. (22.9 ± 4.4 kg/m²).²⁵ The study of these risk factors is important as health disparities between police detainees and the general population might be attributed to socioeconomic disadvantage and behaviours detrimental to health.

Finally, significant differences in health-care use were found between the police detainees and the general population. Interviewed police detainees were less likely to have visited their general practitioner in the previous 12 months compared to members of the general population. Moreover, 28% of the interviewed police detainees reported having no general practitioner. Similar figures were found in two structured-questionnaire surveys conducted among police detainees in London in 2003 and 2007.^{25,26} In these studies, almost 30% of detainees were not registered with a general practitioner. As also acknowledged by Payne-James et al.,²⁵ an important consequence of not having an own general practitioner is the lack of access to regular medical or health-care advice. Accordingly, primary care plays a central role in delivering preventive services, in diagnosis, in long-term disease

management and in coordinating specialty services as a gatekeeper.²⁷ A delay in receiving needed care could result in the presentation of a disease or disorder at a more severe and/or less treatable stage. Our study demonstrated that 1% of the consultations during police detainment resulted in immediate hospital referral. The reasons for referral strongly varied. In addition, 15% of the interviewed police detainees were hospitalised during the previous 12 months.

A major strength of our study is the inclusion of both self-report and registered health data. This unique character of our study provided detailed insight into the reasons and outcome of consultation by the forensic medical service as well as information regarding the general health status of randomly selected police detainees. Furthermore, comparison of the police detainee sample that was visited by the forensic medical service during detainment with a general practice population equivalent for age and gender by using internationally known ICPC coding and prescription data was possible due to the electronic registration of the forensic medical service. In addition, the interviewed police detainee sample held at the cell blocks could be compared with the general population in Amsterdam equivalent for age and gender as the specific questions

Table 6

Self-reported common chronic disorders of the police detainees who participated in the health interview survey ($n = 264$) compared to the general population in Amsterdam.

	Detainees – Health interview	General population ^a	Univariate association		Adjusted for age and gender	
	No. (%)	No. × 1000 (%)	OR (95% CI)	P-value	OR (95% CI)	P-value
Self-reported disorders (last 12 months)						
Chronic pulmonary problems	25 (10%)	50 (8%)	1.2 (0.8; 1.9)	ns	1.9 (1.2; 3.0)	0.008
Chronic joint inflammation	10 (4%)	26 (4%)	0.9 (0.5; 1.8)	ns	2.3 (1.2; 4.6)	0.02
Chronic skin disease	27 (11%)	43 (7%)	1.5 (1.0; 2.3)	0.048	1.5 (0.9; 2.3)	ns
Hypertension	30 (12%)	78 (13%)	0.9 (0.6; 1.4)	ns	2.3 (1.5; 3.6)	<0.001
Diabetes mellitus	8 (3%)	33 (5%)	0.6 (0.3; 1.1)	ns	1.3 (0.6; 2.7)	ns
Cerebral vascular disease	0 (0%)	11 (2%)	–	–	–	–
Heart attack	2 (1%)	9 (2%)	0.5 (0.1; 2.2)	ns	1.3 (0.3; 5.5)	ns
Other serious heart diseases	7 (3%)	21 (4%)	0.8 (0.4; 1.8)	ns	2.3 (1.0; 5.1)	0.04
Cancer	0 (0%)	15 (2%)	–	–	–	–
Any of abovementioned disorders	71 (27%)	191 (31%)	0.8 (0.6; 1.1)	ns	1.6 (1.1; 2.2)	0.005

Whenever there is a zero in any cell of a 2×2 table, corresponding OR (95% CI) and P-value could not be calculated (indicated in the table with '–').

^a Based on weighted estimates of the Amsterdam Health Monitor Survey conducted in 2008.

regarding recent chronic diseases and recent health-care use were identical in both surveys. Our study contributes to several previous studies examining the health of detained persons who did not use such reference populations, identical measures for study outcome or randomly selected individuals.^{6,13}

An important remark is the fact that the health survey data regarding the presence of certain chronic diseases, the health risk measures and health-care use could be criticised. Studies regarding the accuracy of self-report of the medical history by detainees, including those held in police custody, are scarce.²⁸ Nevertheless, the health interview survey was conducted by independent and trained interviewers to oppose any untruthful information provided by the police detainee. Another concern is the representativeness of the interviewed detainee sample. Although a considerable number of randomly selected police detainees participated in the health survey, the participation rate amounted to 66%. The main reason for non-participation was the unwillingness of the police detainee to participate. It cannot be excluded that the police detainees who participated differ from the non-participants with respect to the examined health characteristics, which may limit the generalisability of the results. However, no differences in age and gender between the participating and non-participating detainees were found. Moreover, although analyses were controlled for the influence of age and gender, it should be noted that detainees differed from the citizens of Amsterdam on a number of other characteristics as well. This becomes evident from our comparison of demographic characteristics. Ethnicity, educational level and marital and employment status are known to influence health outcomes and thus should be included as confounders in the analysis. The sample size of the interview sample was insufficient for the introduction of covariates other than age or gender, however. If the sample had been large enough to control for the influence of other background characteristics, the independent influence of the detainee status on health outcomes could have been modelled more clearly. Also with regard to the comparison of general practice patients and those seen by the forensic medical service, we only could control for the influence of age and gender, as other background variables were unknown in these patients.

Finally, it should be noted that the current study is an Amsterdam study and results therefore might not apply to all police detainees in the Netherlands. Possibly, police detainees in more rural areas present different health problems than those arrested in an urban environment. Future research should address this issue by including detainees in other parts of the country. Further, we described the health issues of police detainees held in cell blocks and did not include those held in police stations throughout the city. Generally speaking, those held in cell blocks are suspects of more serious offences. As the investigation in these cases usually takes longer, these detainees are transferred to a cell block if an overnight stay is anticipated. It is unknown if differences regarding health outcomes exist between those held in cell blocks and those held in police stations. In the future, the number of persons held in police stations in the Netherlands will further decline, however, as current national policies are directed towards stronger centralisation of cells in larger cell blocks.

Epidemiological research on the physical health status of police detainees is scarce. The present study fills this gap by describing the physical health-care issues and needs of those detained in police custody, which clearly differ from the general population or from patients seen by the general practitioner. This study provides important input for forensic medical services and educational institutes in the field of forensic medicine. In a police custody setting, the forensic medical service encounters a specific patient population with a variety of somatic health problems. Detainees with diagnosed chronic diseases are dependent on the forensic medical service for medical control and medication. In some cases,

the forensic physician or nurse visits police detainees at request of the detainee or at request of the police for physical problems, which in the community do not always need direct medical intervention or could be dealt with by the patient himself/herself. On the contrary, forensic physicians also see detainees with serious health problems needing urgent medical care. In these cases, adequate primary care is of great importance to identify these health problems and initiate treatment immediately.

Conflict of interest

There is no conflict of interest.

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